



SEQUENCE LISTING

(1) GENERAL INFORMATION:

(i) APPLICANT : Michael D. West  
Jerry W. Shay  
Woodring E. Wright  
Elizabeth Blackburn

(ii) TITLE OF INVENTION: THERAPY AND DIAGNOSIS OF CONDITIONS  
RELATED TO TELOMERE LENGTH  
AND/OR TELOMERASE ACTIVITY

(iii) NUMBER OF SEQUENCES: 57

(iv) CORRESPONDENCE ADDRESS:

(A) ADDRESSEE : Lyon & Lyon  
(B) STREET: 633 West Fifth Street  
Suite 4700  
(C) CITY: Los Angeles  
(D) STATE: California  
(E) COUNTRY: U.S.A.  
(F) ZIP: 90071-2066

(v) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: 3.5" Diskette, 1.44 Mb storage  
(B) COMPUTER : IBM Compatible  
(C) OPERATING SYSTEM: IBM P.C. DOS 5.0  
(D) SOFTWARE: Word Perfect 5.1

(vi) CURRENT APPLICATION DATA:

(A) APPLICATION NUMBER: 08/060,952  
(B) FILING DATE: 1993-05-13

(1) GENERAL INFORMATION:

(iii) NUMBER OF SEQUENCES: 57

(2) INFORMATION FOR SEQ ID NO: 1:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 60  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1:  
TTAGGGTTAG GGTTAGGGTT AGGGTTAGGG TTAGGGTTAG GGTTAGGGTT AGGGTTAGGG 60

(2) INFORMATION FOR SEQ ID NO: 2:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 12  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 2:  
CCCTAACCTT AA 12

(2) INFORMATION FOR SEQ ID NO: 3:  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 12  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 3:  
TTAGGGTTAG GG 12

(2) INFORMATION FOR SEQ ID NO: 4:  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 18  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 4:  
CCCTAACCTT AACCTAA 18

(2) INFORMATION FOR SEQ ID NO: 5:  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 18  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 5:  
TTAGGGTTAG GGTTAGGG 18

(2) INFORMATION FOR SEQ ID NO: 6:  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 24  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 6:  
CCCTAACCTT AACCTAACCT 24

(2) INFORMATION FOR SEQ ID NO: 7:  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 12  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 7:  
CCCTAACCTT AA 12

(2) INFORMATION FOR SEQ ID NO: 8:  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 13  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 8:  
ACGGATGTCT AAC 13

(2) INFORMATION FOR SEQ ID NO: 9:  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 10  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 9:  
TTCTGGTGT 10

(2) INFORMATION FOR SEQ ID NO: 10:  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 13  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 10:  
ACGGATGTCA CGA 13

(2) INFORMATION FOR SEQ ID NO: 11:  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 10  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 11:  
TCATGGTGT 10

(2) INFORMATION FOR SEQ ID NO: 12:  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 13  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 12:  
AAGGATGTCA CGA 13

(2) INFORMATION FOR SEQ ID NO: 13:  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 13  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 13:  
ACGGATGCAG ACT 13

(2) INFORMATION FOR SEQ ID NO: 14:  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 10  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 14:  
CGCTTGGTGT 10

(2) INFORMATION FOR SEQ ID NO: 15:  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 25  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 15: ACGGATTGATTGATGT GGTGT	25
(2) INFORMATION FOR SEQ ID NO: 16: (i) SEQUENCE CHARACTERISTICS: (A) LENGTH: 25 (B) TYPE: nucleic acid (C) STRANDEDNESS: single (D) TOPOLOGY: linear	
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 16: ACGGATTGATTGATGT GGTGT	25
(2) INFORMATION FOR SEQ ID NO: 17: (i) SEQUENCE CHARACTERISTICS: (A) LENGTH: 8 (B) TYPE: nucleic acid (C) STRANDEDNESS: single (D) TOPOLOGY: linear	
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 17: CTGGGTGCG	8
(2) INFORMATION FOR SEQ ID NO: 18: (i) SEQUENCE CHARACTERISTICS: (A) LENGTH: 8 (B) TYPE: nucleic acid (C) STRANDEDNESS: single (D) TOPOLOGY: linear	
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 18: TGTGGGGT	8
(2) INFORMATION FOR SEQ ID NO: 19: (i) SEQUENCE CHARACTERISTICS: (A) LENGTH: 11 (B) TYPE: nucleic acid (C) STRANDEDNESS: single (D) TOPOLOGY: linear	
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 19: GTGTAAGGAT G	11
(2) INFORMATION FOR SEQ ID NO: 20: (i) SEQUENCE CHARACTERISTICS: (A) LENGTH: 5 base pairs (B) TYPE: nucleic acid (C) STRANDEDNESS: single (D) TOPOLOGY: linear	
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 20: TGGTG	5
(2) INFORMATION FOR SEQ ID NO: 21: (i) SEQUENCE CHARACTERISTICS: (A) LENGTH: 12 (B) TYPE: nucleic acid (C) STRANDEDNESS: single (D) TOPOLOGY: linear	
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 21: ACGGATGTCA CG	12
(2) INFORMATION FOR SEQ ID NO: 22: (i) SEQUENCE CHARACTERISTICS: (A) LENGTH: 11 (B) TYPE: nucleic acid	

(C) STRANDEDNESS: single	
(D) TOPOLOGY: linear	
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 22:	
GTGTAAGGAT G	11
(2) INFORMATION FOR SEQ ID NO: 23:	
(i) SEQUENCE CHARACTERISTICS:	
(A) LENGTH: 26	
(B) TYPE: nucleic acid	
(C) STRANDEDNESS: single	
(D) TOPOLOGY: linear	
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 23:	
TTAGGGTTAG GGTTAGGGGG GGGGGG	26
(2) INFORMATION FOR SEQ ID NO: 24:	
(i) SEQUENCE CHARACTERISTICS:	
(A) LENGTH: 26	
(B) TYPE: nucleic acid	
(C) STRANDEDNESS: single	
(D) TOPOLOGY: linear	
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 24:	
TTAGGGTTAG GGTTGGGGGG GGGGGG	26
(2) INFORMATION FOR SEQ ID NO: 25:	
(i) SEQUENCE CHARACTERISTICS:	
(A) LENGTH: 26	
(B) TYPE: nucleic acid	
(C) STRANDEDNESS: single	
(D) TOPOLOGY: linear	
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 25:	
TTAGGGTTAG GGTGGGGGGG GGGGGG	26
(2) INFORMATION FOR SEQ ID NO: 26:	
(i) SEQUENCE CHARACTERISTICS:	
(A) LENGTH: 16	
(B) TYPE: nucleic acid	
(C) STRANDEDNESS: single	
(D) TOPOLOGY: linear	
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 26:	
CCCCCCCCCTA ACCCTA	16
(2) INFORMATION FOR SEQ ID NO: 27:	
(i) SEQUENCE CHARACTERISTICS:	
(A) LENGTH: 16	
(B) TYPE: nucleic acid	
(C) STRANDEDNESS: single	
(D) TOPOLOGY: linear	
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 27:	
CCCCCCCCAA CCCTAA	16
(2) INFORMATION FOR SEQ ID NO: 28:	
(i) SEQUENCE CHARACTERISTICS:	
(A) LENGTH: 16	
(B) TYPE: nucleic acid	
(C) STRANDEDNESS: single	
(D) TOPOLOGY: linear	
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 28:	
CCCCCCCCAC CCTAAC	16
(2) INFORMATION FOR SEQ ID NO: 29:	
(i) SEQUENCE CHARACTERISTICS:	

(A) LENGTH: 24  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear  
 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 29:  
 TTAGGGTTAG GGTTAGGGTT AGGG 24

(2) INFORMATION FOR SEQ ID NO: 30:  
 (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 37  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear  
 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 30:  
 CAATAATGTA TTAAAAATAT GCTACTTATG CATTATC 37

(2) INFORMATION FOR SEQ ID NO: 31:  
 (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 23  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear  
 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 31:  
 TGGTACCGTC GAAAGCTTGA CTG 23

(2) INFORMATION FOR SEQ ID NO: 32:  
 (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 14  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear  
 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 32:  
 ATGAAC TGAC CTAG 14

(2) INFORMATION FOR SEQ ID NO: 33:  
 (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 170  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear  
 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 33:  
 GATCTAGGCA CAGCTGCTTC TCATTAGGCA GGTCTCAGCT AGAAGACCAC TTCCCTCCCT 60  
 GAGGAAGTCA ACCCTTCTGC CACCCCATGG CCTTGCTTAA ATTTCAGAC TGTCGAATTG 120  
 GAATCCTACC TCCATTAGCT ACTAGCTTGG GCAAGATACA GAGCCCTCCC 170

(2) INFORMATION FOR SEQ ID NO: 34:  
 (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 116  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear  
 (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 34:  
 ATATATGCGC TACATAAATG TATCTAGATG CAATTATCTA GATACATATA AGAAAGTATT 60  
 TGAAGGCCTT CTACAAGGCT TAGTTATTAT ATTGGTTCAT ACAAGTTCTT CTTCAAG 116

(2) INFORMATION FOR SEQ ID NO: 35:  
 (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 176  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 35:

ATCCTTCTCC	GCAAACTAAC	AGGAACAGAA	AACCAAACAC	TGCATGTTCT	CACATCATTG	60
TGGGAGTTGA	ACAATGAGAA	CACATGGACA	CAGGGAGGGG	AACATCACAC	ACTCGGGGTG	120
TCAGCCGGGT	GGGAGGGTAG	AGGAGGAGAA	ATACCTAAGT	TCCAGATGAC	AGGTTG	176

(2) INFORMATION FOR SEQ ID NO: 36:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 169

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 36:

GATCTATGCT	ACCTCTAGGG	ATGGCACCAT	TCACAAGCAC	AAAGGAGATG	TCAGTGATTA	60
AAAACACATG	CTCTGGAGTC	TGAGAGACTT	TGAGACTTGC	TAGCTTGTGA	CTCTGCAGAG	120
TTTAAGGTAT	CTGGACCCCT	TTTCCCTCA	TGTGCATAAT	GAAGAGATT		169

(2) INFORMATION FOR SEQ ID NO: 37:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 192

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 37:

GATCAACACT	GTTAGTTGAG	TACCCACATC	ACAAACGTGA	TTCTCAGAAT	GCCTTCCTTC	60
CTGCTCTAGTT	TCTATAGTA	GATATTCCT	TTTCAGCAT	AGGCCTGAAA	AGCCGCCTCC	120
AAATGCCCGC	CTTCCAGACA	CTATAAAAAG	AGGGTTCAAA	CCTACTCTAT	GAAAGGGAAT	180
GTTCAACACA	GA					192

(2) INFORMATION FOR SEQ ID NO: 38:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 157

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ix) FEATURE:

(D) OTHER INFORMATION: The letter "N"stands for any base.

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 38:

GATCTGTTA	TTATTCTTCC	AATATCTCCC	CATCTCTAA	AAATTGGTTA	TTTCTCGTT	60
CATACATTT	TATCTCCAA	ATTANNNNTG	AGACTGGTT	GAAGAGAGGA	AAGCAATGTA	120
CACACTTTA	TATTCCACCA	TGTATATCCG	GATATCC			157

(2) INFORMATION FOR SEQ ID NO: 39:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 135

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 39:

AATCCTCCTA	CCTTAACCTC	CCTTGTTAG	CCTGCCATTA	CAGGTGTGAG	CCACCATTGC	60
TCATTCGTCC	GTTTATTTCAT	TCAACAAATC	AATCGATCTA	TTACATGTGA	GGGACTCTTC	120
AGGTCTATGGG	AATTC					135

(2) INFORMATION FOR SEQ ID NO: 40:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 117

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ix) FEATURE:

(D) OTHER INFORMATION: The letter "N"stands for any base.

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 40:

GATCACTTGA	GCCCAGGAGT	TTGAGACCAG	CCTGGGTGAC	ATGGCAAAAC	CCCATCTCTA	60
CCAAAAGAAA	AAAANNNNAC	AAATTGGTGG	TGTTGATGGT	CGGCGACCAT	TGATCCC	117

(2) INFORMATION FOR SEQ ID NO: 41:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 137

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 41:

GATCAGGGAG	GGGCGAAAAA	CTGGAGATGC	AGGTGTGCTG	TAAGACACTG	CAGAGAGGGC	60
ATTTACCTGC	CCCATCATCC	AGCACAGGAA	CAGCGACTGA	CAGCGCTCAC	CCACCCACCA	120
TCGCCAGTCA	CACTGGG					137

(2) INFORMATION FOR SEQ ID NO: 42:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 80

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 42:

GGCTCGAGAA	CGGGAGGAGG	GGGCTCTTGT	ATCAGGGCCC	GTTGTCACAT	CTGCTCTCAG	60
CTTGTGAAA	ACTCATAATC					80

(2) INFORMATION FOR SEQ ID NO: 43:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 157

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 43:

AGGTCCCTTG	GTCGTGATCC	GGGAAGGGC	CTGACGTTGC	GGGAGATCGA	GTTCCTGTG	60
GGCTGGGGA	ACCTCTCACG	TTGCTGTGTC	CTGGTGAGCA	GCCCAGACCA	ATAAACCTGC	120
TTTCTTAAA	AGGAAAAAAA	AAAAAAA	AAAAAAA			157

(2) INFORMATION FOR SEQ ID NO: 44:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 120

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 44:

ATCTAGGTTT	TTTAAAAAAG	CTTGAGAGG	TAATTACTTG	CATATGAGAG	AATAAACAT	60
TTGGCACATT	GTTAAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	AAAAAAA	120

(2) INFORMATION FOR SEQ ID NO: 45:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 149

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 45:

CTCATTACT	TTTCTCTTAT	AGCGTGGCTT	TAAACATATA	TACATTGTA	TATATGTATA	60
TATGAATATA	ATGTATAAAA	TGTATGTAGA	TGTATATACA	AAAAATAAAC	GAGATGGT	120
AAAGATATGT	AAAAAAA	AAAAAAA				149

(2) INFORMATION FOR SEQ ID NO: 46:

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 142  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 46:  
 AGTCCCAGCT ACTCGGGAGG GCTGAGGCAG GAGAATGGCG TGAACCCAGG AGGCGAAGCT 60  
 TGCACTGAGC TGAGATCGCG CCACTGCACT CCAGCCTGGA CGACAGAGCG AGACTCTGTC 120  
 TCAAAAAAAA AAAAAAAA AA 142

(2) INFORMATION FOR SEQ ID NO: 47:  
 (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 7 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 47:  
 TGGTGTG 7

(2) INFORMATION FOR SEQ ID NO: 48:  
 (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 9 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 48:  
 TGGTGTGTG 9

(2) INFORMATION FOR SEQ ID NO: 49:  
 (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 11 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 49:  
 TGGTGTGTGT G 11

(2) INFORMATION FOR SEQ ID NO: 50:  
 (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 13 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 50:  
 TGGTGTGTGT GTG 13

(2) INFORMATION FOR SEQ ID NO: 51:  
 (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 15 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 51:  
 TGGTGTGTGT GTGTG 15

(2) INFORMATION FOR SEQ ID NO: 52:  
 (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 6 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single

(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 52:  
TGGGTG 6

(2) INFORMATION FOR SEQ ID NO: 53:  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 8 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 53:  
TGGGTGTG 8

(2) INFORMATION FOR SEQ ID NO: 54:  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 10 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 54:  
TGGGTGTGTG 10

(2) INFORMATION FOR SEQ ID NO: 55:  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 12 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 55:  
TGGGTGTGTG TG 12

(2) INFORMATION FOR SEQ ID NO: 56:  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 14 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 56:  
TGGGTGTGTG TGTG 14

(2) INFORMATION FOR SEQ ID NO: 57:  
(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 16 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 57:  
TGGGTGTGTG TGTGTG 16